Gartner Research

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PC Power Management Activation Leads to Significant Power and Cost Savings

Charles Smulders, Federica Troni

Much of the attention on power consumption has focused on the data center, but PC power consumption within an organization can be significant. We quantify the impact of applying PC power management policies.

Key Findings

- Total PC power consumption per year for a well-managed 2,500-PC-strong organization is 50% lower than for an unmanaged one.
- Organizations actively employing power management functionality can expect to save $38.3 thousand per year compared to unmanaged ones (based on the number of machines).
- Additionally, turning off and unplugging machines saves another $7.3 thousand, but may affect employee productivity because updates will need to be carried out during working hours (based on the number of machines).

Recommendations

- Recognize internally that PC power consumption is a contributor to your organization's office expenses.
- Recognize that the greatest savings come from employing power management features, not switching off or unplugging PCs.
- Establish a policy for setting power management states for the organization, such as turning off monitors after hours and communicating why it is important.
- Actively employ power management features on new and established PCs and monitors.
- Investigate specific tools (for example 1e's NightWatchman) to implement these policies and better support management activities.

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1.0 Model Overview

Gartner has created a model for assessing the impact of different variables on an organization's total PC power use. The model includes power consumption for desktops, notebooks and associated monitors during the workday and after hours. In this research, we look at three different scenarios:

- Well-managed
- Unmanaged
- Unplugged

Although we concentrate on these three specific scenarios, the model can be used to assess the PC-related power consumption of any organization.

2.0 Common Model Assumptions

The following assumptions are common to all three scenarios:

- There are 2,500 employees.
- The ratio of PCs to employees is 1:1.
- Fifty-five percent of PCs are notebooks and 45% desktops.
- Ninety percent of notebook PCs have an external monitor associated with them.
- Fifty percent of monitors are cathode ray tube, and 50% are flat-panel LCDs.
- Employees work an eight-hour workday.
- Employees work 230 days per year.
- Active use of the PC during work hours is 70% of the time.
- The power calculation assumes 1 kilowatt-hour costs $0.086 cents.
- The adjusted power consumption cost calculations assume notebooks are used on the organization's premises 50% of the workday.

3.0 Individual Scenario Assumptions

3.1 Well-Managed

- Power management features are activated on all devices. Power management features are shipped as activated.
- Desktop devices are not switched off or unplugged after hours, enabling remote updates to be carried out.
- Notebook devices are switched off/put in suspend mode 50% of the time after hours; of those, 50% are unplugged after hours.

3.2 Unmanaged

- No attempt is made to manage or control the power management features.
- Users are left to decide whether to activate or deactivate power management features.
- Desktop users activate power management features in 50% of cases.
- Notebook users activate power management features in 50% of cases.
- Notebook devices after hours are switched off/put in suspend mode 50% of the time; of those, 50% are unplugged after hours.
- Fifty percent of desktops are switched off after hours, and none are unplugged.

3.3 Unplugged

- As in the well-managed case, but all PC devices are unplugged when not in use after hours.

4.0 Adjusted Power Consumption

The adjusted power consumption results reflect the power used and paid for by the organization. This figure excludes the power consumed when a mobile PC is being used off the organization's premises.

4.1 Results

Table 1 shows the results for each of the three scenarios. The table segments power use by during work hours and after hours and the impact on power within each. Table 2 shows the overall impact on cost.

Table 1. Annual PC Power Consumption (kilowatt-hours) of a 2,500-PC Organization

	PCs	Monitors	Total
Well-Managed			
Workday	223,238	169,909	393,147
After Hours	44,288	53,768	98,056
Total	267,526	223,677	491,203
Unmanaged			
Workday	250,148	190,995	441,143
After Hours	367,625	179,258	546,883
Total	617,773	370,253	988,026
Unplugged			
Workday	223,238	169,909	393,147
After Hours	0	0	0
Total	223,238	169,909	393,147
Annual Adjusted PC Power Consumption (kilowatt-hours) of a 2,500-PC Organization			
	PCs	**Monitors**	**Total**

	PCs	Monitors	Total
Well-Managed			
Workday	186,868	119,245	306,113
After Hours	33,697	50,760	84,456
Total	220,565	170,004	390,569
Unmanaged			
Workday	212,474	134,071	346,545
After Hours	308,410	180,928	489,338
Total	520,884	314,999	835,883
Unplugged			
Workday	186,868	119,245	306,113
After Hours	0	0	0
Total	186,868	119,245	306,113

Source: Gartner (August 2007)

Table 2. Annual PC Power Cost of a 2,500-PC Organization

	PCs	Monitors	Total
Well-Managed			
Workday	19,198	14,612	33,811
After Hours	3,809	4,624	8,433
Total	23,007	19,236	42,243
Unmanaged			
Workday	21,513	16,426	37,938
After Hours	31,616	15,416	47,032
Total	53,128	31,842	84,970
Unplugged			
Workday	19,198	14,612	33,811
After Hours	0	0	0
Total	19,198	14,612	33,811
Annual Adjusted PC Power Cost ($) of a 2,500-PC Organization			
	PCs	**Monitors**	**Total**
Well-Managed			
Workday	16,071	10,255	26,326
After Hours	2,898	4,365	7,263
Total	18,969	14,620	33,589
Unmanaged			
Workday	18,273	11,530	29,803
After Hours	26,523	15,560	42,083

	PCs	Monitors	Total
Total	44,796	27,090	71,886
Unplugged			
Workday	16,071	10,255	26,326
After Hours	0	0	0
Total	16,071	10,255	26,326

Source: Gartner (August 2007)

5.0 Annual Power Use and Power Cost Estimates for a 2,500-Employee Organization Under Well-Managed, Unmanaged and Unplugged Scenarios

Table 1 shows that with proper policies in place, substantial power and cost savings can be made without an impact on user productivity.

The annual PC power consumption of a well-managed, 2,500-PC organization is calculated to be 491.2 megawatt hours. The difference in annual power consumption between running a well-managed environment and an unmanaged PC power environment is 496.8 megawatts, or more than double the well-managed figure. The annual cost savings associated with a well-managed environment vs. an unmanaged one are $42.7 thousand. This assumes that all power is paid for by the organization. Excluding the power consumed when mobile PCs are used outside the organization's premises, the annual cost savings are calculated to $38.3 thousand.

Unplugging machines brings a further 22% in power and cost savings compared to a well-managed environment; however, we believe that implementing such policies is impractical and is likely to obstruct productivity because updates cannot easily be done after hours.

RECOMMENDED READING

"Managing Through a New PC Energy Star Specification"

REGIONAL HEADQUARTERS

Corporate Headquarters
56 Top Gallant Road
Stamford, CT 06902-7700
U.S.A.
+1 203 964 0096

European Headquarters
Tamesis
The Glanty
Egham
Surrey, TW20 9AW
UNITED KINGDOM
+44 1784 431611

Asia/Pacific Headquarters
Gartner Australasia Pty. Ltd.
Level 9, 141 Walker Street
North Sydney
New South Wales 2060
AUSTRALIA
+61 2 9459 4600

Japan Headquarters
Gartner Japan Ltd.
Aobadai Hills, 6F
7-7, Aobadai, 4-chome
Meguro-ku, Tokyo 153-0042
JAPAN
+81 3 3481 3670

Latin America Headquarters
Gartner do Brazil
Av. das Nações Unidas, 12551
9° andar—World Trade Center
04578-903—São Paulo SP
BRAZIL
+55 11 3443 1509

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